KOMAR, A.

THE ANOMALOUS CHANGE OF THE ELECTRIC RESISTIVITY OF THE Ni-Mn ALLOY IN
THE MAGNETIC FIELD. A. Komar and I. Portnyagin (S. M. Kirov Ural Indust.
Inst., Sverdlovsk). Doklady Akad. Nauk S.S.S.R. 60, 569-70 (1948). —
The relative changes of the elec. resistance r in a longitudinal and in
a transverse magnetic field H were detd. for alloys Ni 75.6–Mn 24.3 at
. %, quenched after annealing at temps. between 700 and 250°, which
corresponds, resp., to completely disordered and to completely ordered
condition. Depending on its degree of order, this alloy changes its
spontaneous magnetization and its Curie temp. (K. and Volkenshtein, J.
Exptl. Theoret. Phys. (U.S.S.R.) 11, 723 (1941)). In the unordered state,
the shapes of the curves of $\Delta r_{\parallel}/r$ and $\Delta r_{\perp}/r$ as functions of H, at 293
and at 77°K., are analogous to those of pure Ni in the neighborhood of
the Curie point (Englert, C.A. 26, 3153). In the ordered state, at
293°K., both $\Delta r_{\parallel}/r$ and $\Delta r_{\perp}/r$ are neg., have close values throughout,
and increase (in abs. value) with increasing H along practically the

(Continued)

(Continued)

same curve. At intermediate degrees of order, $\Delta r_{\parallel}/r$ changes its sign
at a definite H, depending on the degree of order.

N. Thon

Immediate source clipping

(Continued)

autoelectronic emission masks the photoelec. emission; at about $E =$
10^5, the dark current is about 10^{-10} amp./sq. cm.; from there on, the
autoelectronic current i_a rises steeply with E, increasing 107 times
with E increasing 4 times. Expts. confirm the relation $i_a = AE^2\epsilon^{-a/E}$.
The cathode could be observed visually by coating the anode with
willemite; while in photoelec. emission the whole surface of the
cathode is seen to emit uniformly, autoelectronic emission in strong
fields is confined to discrete points, visible as bright spots, and
evidently corresponding to edges with a high potential gradient; the
over-all exponential relation between i_a and E holds also for indi-
vidual spots. From the diam. D of the spots, the tangential com-
ponent V_o of the initial energy of the electrons can be detd. by

(Continued)

(Continued)

the temp., namely $R_{p} - R_{\theta} = c(J_{p}^{2} - J_{\theta}^{2})$ (where θ is a temp. close to the Curie point). This type of relation should hold for all ferromagnetics for which the elec. cond. at temps. close to the Curie point depends on the spontaneous magnetization.

N. Thon

Immediate source clipping

KOMAR, A.

32452.   Grabarev, L. Primeneniye obyazatel'nykh tekhnologicheskikh pravil na
zhilstroitel'stve tresta-Dneprovskpromstroy-Stroit. prom-st', 1949, No. 10, s. 9-12.

SO: Letopis' Zhurnal'nykh Statey Vol. 44

*Primary analysis of technical accuracy in construction by
Dneprostroy Trust.*

KOMAR, A. P.

35812. Ferromagnitnye svoystva splavov i dal'niy poryadok stomov (Doklad na
vsesoyuz. Konferentsii po fizike magnitnykh yavleniy. Sverdlovsk dok. 1947G.)
Trudy In-Ta fizini metallov, VIP. 12, 1949, S. 50- 1--Bibliogr: 33 Nazv.

SO: Letopis' Zhurnal'nykh Statey, Vol. 49, Moskva, 1949

KOMAR, A. P.

USSR/Physics - Semiconductors,   1 Nov 53
              Ferromagnetic

"Thermal Behavior of Magnetization of Nickel-Zinc Ferrites in Weak Fields," A. F. Komar and N. M. Reynov

DAN SSSR, Vol 93, No 1, pp 19-20

Present curves of magnetization of nicket-zinc alloy for room temp, liquid Ni, liquid H and liquid He temps in fields up to 600 oerst. Presented by Acad M. A. Leontovich 7 Sep 53.

275T88

Physics of the ionosphere and the propagation of radiowaves [translations and surveys of foreign periodical literature]. Probl.sovr.fiz. 6 no.4: 3-212 '54.   (MLRA 7:6)

1. Deystvitel'nyy chlen Akademii nauk USSR.
      (Ionosphere) (Radio waves)

USSR/Physics

Card 1/1   Pub. 43 - 11/15

Authors   : Komar, A. P., and Klyushin, V. V.

Title   : Dependence of the electrical resistance of ferrites upon temperature

Periodical : Izv. AN SSSR. Ser. fiz. 18/3, 400-402, May-Jun 1954

Abstract   : Experiments were conducted to determine the dependence of the electrical
               resistance of ferrites upon temperature at the point of ferromagnetic
               conversion. Data regarding this dependence may be useful in estimating
               the type of ferromagnetic conversions and in determining the mechanism of
               origination of spontaneous magnetization in ferrites. The noticeable chan-
               ge in temperature gradient of the electrical resistance during passing
               through the zone close to the Curie point indicates a change in the condi-
               tion favorable for the appearance of conductivity electrons as well as in
               the conditions favorable for their continuous existence. Five references:
               4 French and 1 USSR (1950-1952). Graphs.

Institution : Academy of Sciences USSR, Physico-Technical Institute

Submitted   : May 3, 1954

USSR/Physics

Card 1/1   Pub. 43 - 12/15

Authors   : Komar, A. P., and Klyushin, V. V.

Title   : The Goldhammer-Thomson effect in ferrites

Periodical   : Izv. AN SSSR. Ser. fiz. 18/3, 403-405, May-Jun 1954

Abstract   : The Goldhammer-Thomson effect in ferrites was investigated to establish
                whether there is any connection between the change in electrical resistance
                in the magnetic field and magnetization. It was found that the longitudinal
                and lateral G-T-effects in ferrites have a electrical negative sign. The
                deviation from the second law of Akulov's even-effects in ferrites is ex-
                plained by the insignificant role of the para-process and by the volumetric
                magnetostriction effect. The galvano-magnetic effect in this case was found
                to have a complex bond with the magnitude of total magnetization. Five
                references: 3 French and 2 USSR.

Institution : Academy of Sciences USSR, Physico-Technical Institute

Submitted   : May 3, 1954

KOMAR, A. P.

5
14614

Investigation of the temperature dependence of spontaneous magnetization of some ferrites at low temperatures. A. P. KOMAR, N. M. REINOV, AND
Izvest. Akad. Nauk. S.S.S.R., Ser. Fiz. 18, 141 ?
19 [4] 2137g (1955) — An apparatus is described for spontaneous magnetization. Low temperature Curie point of a ferrite material. The sample was annealed at 1350° and room temperature in 6 hr. Saturation ??? oersteds. The curve I/I_0 vs temperature ???

temperature in 6 hr.   Saturation

The curve I/I_s vs. temperature

spontaneous magnetization at

crease of saturation magnetization

this contradicts the theory of

at low temperature due to the presence

magnetic field strength was 0-64 X 10° oersteds. At 77 K.
the deviation from linearity starts for fields

KOMAR, A. P.

USSR/

Card   : 1/1

Authors   : Komar, A. P., and Selitskiy, Yu. A.

Title   : Experiments with an ion projector

Periodical : Dokl. AN SSSR, 96, Ed. 5, 957 - 958, June 1954

Abstract   : It was suggested that a proton (ion) projector be used for studying
              structural changes in the surfaces of Al, W, Fe and other monocrystals
              instead of an electron projector, because the resolving power of the
              former is much higher. Pictures taken with the help of proton and
              electron projectors are given for comparison. Four references. Photos.

            : Acad. of Sc. USSR. Physico-Technical Institute, Leningrad

            : Academician, P. I. Lukirskiy, March

SHALYT,

KOMAR, A.P.; REYKOV, N.M.; SHALYT, S.S.

Investigation of photomagnetoelectric effect in cuprous oxide at low temperatures. Izv.AN SSSR.Ser.fiz. 19 no.4:444-446 Jl-Ag
'55.   (MLRA 9:1)

1.Fiziko-tekhnicheskiy institut Akademii nauk SSSR.
(Copper oxide--Electric properties) (Photoelectricity) (Low tem-
                                            perature research)

KOMAR, A.P.

GRIBOVA, M.P., tekhnicheskiy redaktor; YAPPA, Yu.A., redaktor; KOMAR, A.P., otvetstvennyy redaktor, professor; POPOV, R.Yu, redaktor.

Classification of elementary particles [translations and surveys of foreign periodical literature]. Problemy sovremennoi fiziki 8 no.11:1-173 '56.   (MLRA 10:1)
            (Particles, Elementary)

Experiments with an electron and ion microscope. A. R. Komar and Yu. N. Talanin (Leningrad Phys. Tech. Inst. Acad. Sci. U.S.S.R.). Izvest. Akad. Nauk S.S.S.R., Ser. Fis. 20, 1137-41(1956).—A continuously evacuated electron projector had a W point emitter. Some observations can be made in spite of relatively bad (10^{-7}–10^{-4} mm.) vacuum conditions. A model and photographs are given for the most frequent crystal orientation in the W point. This form is close to the rhombododecahedral (011) cut by the planes (001), (111), and (112). This form is close to the

Use of a pulse ionization chamber as an electrometer. B. A. Bochagov, S. L. Yarohlev, and A. P. Zhdan. Phys. Zh. Tekh. Fiz. Leningrad; Zav i Lab v ... Ser. Fiz. 20, 1-65-6X [1958] - The theory of an ionization chamber contg. a high voltage electrode with an auxiliary a grid, and a collector electrode is described ... of error is considered which are di... ... of ions formed by an α-particle ... ~ 7.7 e-kv. for 5-m.e.v. particles and ... d ... source. The total error caused would be ... above of 25 e kv. Numeric estimation ... $10-15\%$ of all particles are neg... ... collimated and a noncollimated ... natural mist. of isotopes ... can be used for the isotope of a...

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The angular distribution of the photoprotons from A⁰ which was irradiated with the
γ-bundle of a synchroton with the maximum energy of 90 MeV, was investigated. The
photoprotons with an energy of from 2 to 10 MeV were registered by means of a
WILSON chamber which was filled at a pressure of 1,4 atm with argon and with the
vapors of a mixture of ethyl alcohol and water. The Wilson chamber, which has a dia-
meter of 30 cm and a depth of 7 cm, works in a cycle with overpressure with a period
of from 10 to 15 sec. The argon contained by the Wilson chamber was irradiated with
a collimated γ-bundle of 1,8 cm diameter, which incides into the chamber trough an
aluminium window (100μ) in its lateeal wall. The proton traces formed as a result
of the reaction (γ,p) were photographed stereoscopically.
302 traces were dealt with. Angles were measured by the reprojection method and with
an accuracy of from 1 to 2⁰. The histogram contained in the attached drawing was drawn
by joining the traces with intervals of 20⁰. Directivity in a forward direction with
a maximum at the angle of 70⁰ is distinctly discernible. The course taken by the curve
obtained here for the angular distribution of the photoprotons from argon agrees
sufficiently well with the course of angular distribution obtained by B.M. SPICER,
Phys.Rev., 100, 791 (1955) by the method of nuclear emulsions and with a maximum
energy of the γ-bundle of 22,5 MeV.

are shown as black spots
bio to identify particles
affectiveness of the
energy change
actions and
apparatus
the tracks
crease the
leas than
cat a
present

KOMAR, A.P.

BAZHANOV, Ye.B., CHIZHOV, V.P., KOMAR, A.P., KUL'CHITSKIY, L.A.

VOLKOV, Yu.M., and YAVOR, I.P.

"Photodisintegration of Nuclei by Gamma-Radiation from Leningrad Synchrotron at 60-90 Mev."

Physics Inst. im Lebedev, Acad. Sci. USSR

paper submitted at the A-U Conf. on Nuclear Reactions in Medium and Low Energy Physics, Moscow, 19-27 Nov 57.

Photographs from about 10

Exterior view

Interior - S. p. 51,

Autr: 652c

2716
INVESTIGATION OF THE ALLOTROPIC TRANSFORMATION $\alpha \to \beta$ Zr WITH THE AID OF AN ELECTRON PROJECTOR. A. P. Komar and V. N. Shrednik, Acad.
of Sciences, USSR, Soviet Phys. JETP

Aug

126-5-3-11/31

AUTHORS: Komar, A.P. and Shrednik, V. N.

TITLE: α⇄β Transformation of Zirconium as Observed by Means of an Electronic Projector (Prevrashcheniya α⇄β tsirkoniya po nablyudeniyam s pomoshch'yu elektronnogo proyektora)

ABSTRACT: The aim of the work described in this paper, which was started before the publication of the paper by E.G.Brock (Phys. Rev., 1955, Vol 100, p 1619), was to evaluate the potentialities of the electron projector method for studying phase transformations; to verify by means of this method the crystallographic relations between the lattices of α and β zirconium obtained by Burgers by means of the X-ray method on macroscopic specimens; to elucidate the role of the size and shape of the crystal on the type of mutual orientation of the lattices of the α and β phases. The authors took into consideration the fact that study of zirconium by means of an electron projector is of great interest also from the experimentation point of view, Muller (Ref.6). So far no regular pictures of auto-electron emission of zirconium has been obtained proving symmetry of the crystal. Even in the

Card 1/6

126-5-3-11/31

α⇄β Transformation of Zirconium as Observed by Means of an
Electronic Projector

best vacuum only irregular spots of auto-electron emission
are obtained which are due apparently to various
contaminations of the crystal surface.   In their experi-
ments, the authors used an ordinary electron projector
as described by Muller (Ref.6).   The anode consisted of
a layer of "conducting glass" (Ref.8) on the inside of a
spherical glass flask, the surface of which was coated
by villemite.   The work was carried out with projectors
which were continuously evacuated as well as sealed
projectors containing tantalum getters.   The α⇄β
phase transformation is investigated for zirconium single
crystals of sizes of the order of one micron.   By using
the electron projector method it is possible to observe
visually the transforming crystal at a magnification of
100 000 times.   Emission pictures were obtained of crystals
of the cubic (β zirconium) as well as the hexagonal
(α zirconium) symmetry.   The results confirmed the
relations published by Burgers, W.G., (Physica, 1934, Vol 7,
p 561). Usually during transformation only one of the
Card 2/6 possible orientations of the new phase relative to the

126-5-3-11/31

$\alpha \rightleftarrows \beta$ Transformation of Zirconium as Observed by Means of an Electronic Projector

initial phase manifests itself, which is attributed to the considerable role of the surface energy in the case of crystals of small dimensions.   Signs of dislocation have been detected in zirconium crystals, which are attributed to a diffusionless mechanism of transformation. The method of identification and of indication of the emission pictures of the faces of the zirconium crystal is explained in para.3.   Since in the first approximation the shape of the end of the projector point can be assumed as being semi-spherical and since the dimensions of the radius of the point are considerably smaller than the radius of the sphere of the projector, the electric field between the point and the sphere of the projector can,in the given approximation,be considered as the field of a spherical condenser in which the electrons will move along radii of the projector sphere.   On hitting the villemite screen, the electrons will produce light on the screen and will produce on the sphere of the projector an orthogonal projection of the faces and edges of the crystal.   On this projection it is easy to designate the centres of the faces which can be considered as being

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126-5-3-11/31

$\alpha \rightleftarrows \beta$ Transformation of Zirconium as Observed by Means of an
Electronic Projector

spherical projections of the normals to the edges.
Obviously, this spherical projection of the normals can
easily be inter-related with the gnomo-stereographic
projection of the crystal which also enables deciphering
the auto-emission picture, which is described.   The
results of the experiments are described in para.4,which
deals with the structure of the face surface and auto-
emission as well as with the picture of auto-emission and
of $\alpha \rightleftarrows \beta$ transformation of zirconium. The results are
evaluated in para.5. The following conclusions are
arrived at:
1. By means of the electron projector it is possible to
determine from the **nature of the faces** of a crystal point,the
mutual orientation of the lattices of the individual
phases **during** polymorphous transformations. For the
case of zirconium, the mutual orientation of the lattices
of the α and the β phases, earlier determined by
Burgers by means of the X-ray method, was confirmed.
2. The polymorphous transformation of zirconium in the
Card 4/6 case of crystals with linear dimensions of the order of a

126-5-3-11/31

$\alpha \rightleftarrows \beta$ Transformation of Zirconium as Observed by Means of an Electronic Projector

micron takes place according to the non-diffusional method throughout the entire volume of the crystals.

3. The non-equilibrium pseudo-morphous crystal of the accompanying phase becomes transformed into the equilibrium state in the case of high surface mobility of the atoms so that the faces with low indices of the basic and the accompanying crystals remain strictly or approximately parallel.

4. In the case of the studied zirconium crystals, with linear dimensions of about 1μ, those possible orientations become materialised during transformations which involve a minimum change of the surface energy.

5. The temperature of the polymorphous transformation of the zirconium depends strongly on the quantity of the nitrogen and oxygen absorbed by the zirconium,increasing with increasing concentration.

6. The observed faces of the zirconium crystals with cubic symmetry are not equilibrium faces of pure zirconium but equilibrium faces of crystals of the solid solution of nitrogen and zirconium in presence of a strong electric

Card 5/6

126-5-3-11/31

$\alpha \rightleftarrows \beta$ Transformation of Zirconium as Observed by Means of an Electronic Projector

field and a high temperature.
7. The layer by layer spiral destruction of crystals of hexagonal symmetry in a reverse electric field begins from the centres of the faces (11$\bar{2}$0), (10$\bar{1}$2), (10$\bar{1}$2) and (2$\bar{1}\bar{1}$0) and this is possibly due to the presence of spiral dislocations, the axes of which are normal to the respective atomic planes of the hexagonal lattice. There are 8 figures and 23 references, 7 of which are Soviet, 7 German, 9 English.

ASSOCIATION: Leningradskiy fiziko-tekhnicheskiy institut AN SSSR
           (Leningrad Physico-Technical Institute, Ac.Sc., USSR)

SUBMITTED: November 9, 1956

         1. Zirconium--Transformations 2. Zirconium crystals--Lattices
         3. Single crystals--Physical properties   4. Electron microscopy

Card 6/6

Komar, A.P.

120-6-17/36

AUTHORS: Komar, A.P., and Yashukov, V.P.

TITLE: Instrument for Automatic Determination of Small Non-
uniformities of Variable Magnetic Fields (Pribor dlya
avtomaticheskogo opredeleniya malykh neodnorodnostey
peremennykh magnitnykh poley)

PERIODICAL: Pribory i Tekhnika Eksperimenta, 1957, No.6,
pp. 75 - 78 (USSR).

ABSTRACT: An instrument is described which permits observing on the
screen of an oscillograph the curve of the non-uniformity of
a magnetic field caused by slight differences in the amplitude
or phases at various points of the gap of an electromagnet.
Since in modern betatrons and synchrotrons the injection takes
place at a low magnetic field potential in the gap of a magnet,
the occurring deviations of the magnetic field potential are
commensurate with the magnitude of the field potential at the
instant of injection. Such non-uniformity of the magnetic
field along the azimuth and the radius at the instant of
injection leads to an increase in the amplitude of oscillations
of the electrons and to falling of the electrons onto the
walls of the chamber. In betatrons, non-uniformities in the
magnetic field potential occur in the gap of the magnet and
Card1/2 the accelerator at the instant of injection of electrons. The

congress.

Card 2/2

KOMAR, A.P.

PA - 2815

AUTHOR:
TITLE:
YAVOR, I.P., KOMAR, A.P.
High-Speed Cloud Chamber Synchronized with Synchrotron. (Bystrodey-
stvuyushchaya kamera Vil'sona sinkhronizovannaya s sinkhrotronom,
Russian)

ABSTRACT: The construction and the method of operation of the WILSON chamber is
described. The WILSON chamber works according to a cycle with over-
pressure and 10-15 sec periods. The control scheme with pressure modi-
fication in the chamber and some details on the method of operation
are described. In the second part the synchronization scheme of the
work of the chamber and its control elements as well as those of the
synchrotron are given. The scheme worked out in the laboratory of the
institute satisfies the requirements for the investigation of photo-
nucleus reactions and elasticity is such that it may be used also for
complicated working conditions. The basic elements are: an impulse
generator which determines the working period of the chamber
(T = 5 + 60 sec) and the scheme of coincidence which gives the per-
forming schemes (vibrators with delays and amplifications) its impulses.
The direct control of the output of γ-ray impulses of the synchrotron
is accomplished by means of two types of impulses. The synchronization
takes place for 100 MeV. The scheme works reliably and needs no
subsequent regulation.

Card 1/2.

Association: Academy of Sciences, USSR

KOMAR, A.P.

57-27-7-20/40

AUTHORS: Bochagov, B. A., Vorob'yev, A.,

TITLE: An Impulse Ionization Chamber as a Device for the Simultaneous In-
vestigation of the Energetic and Angular Distributions of Charged
Particles (Impul'snaya ionizatsionnaya kamera kak pribor dlya
odnovremennogo izucheniya energeticheskikh i uglovykh raspredeleniy
zaryazhennykh chastits).

ABSTRACT: It is shown that the energy E (half width of the lines of α-spectra)
and the angle of flight φ (between the normal to the electrodes
and the direction of flight of the charged particle) of the par-
ticle concerned can be determined beginning from the source, when
the quantity of the impulse V_1 (the voltage at the collecting
electrode) and the quantity of one of the impulses V_2 (the voltage
at the high-voltage electrode), V_3 (the voltage at the power supply
or V_4 (the voltage at the moment where all electrons have reached
the collecting electrode) is simultaneously measured. The accuracy
of measurement of cos φ in this connection is about 3% and can be
improved. At present a mechanical collimator is often used in
measurements of the energy of α-particles may also be brought to
collimation without a mechanical collimator due to the fact that
the ionization chamber permits a simultaneous measurement of E and

Card 1/2

57-27-7-20/40

An Impulse Ionization Chamber as a Device for the Simultaneous Investigation of the Energetic and Angular Distributions of Charged Particles.

φ. The method suggested here can also be employed for the solution of problems of α-spectroscopy, for the investigation of the $\alpha-$ - correlation, the neutron-spectrum according to the protons given off and for the investigation of the angular distribution of heavy products of nuclear reactions. There are 3 figures.

ASSOCIATION: Leningrad Polytechnic Institute imeni M. I. Kalinin (Leningradskiy politekhnicheskiy institut im. M. I. Kalinina)

SUBMITTED: January 27, 1956

AVAILABLE: Library of Congress

1. Ionization chambers—Applications   2. Particles—Energy—Measurement
3. Particles—Transmission—Analysis

Card 2/2

AUTHOR: KOMAR,A.P., SHREDNIK,V.N.

TITLE: Investigation of the Allotropic Transformation α ⇄ β Zr with the Aid of an Electronic Projector. (Izucenie allotropices-kogo prevraščenija α ⇄ β Zr pri pomošči elektronnogo pro-ektora, Russian).

PERIODICAL: Zhurnal Eksperimental'noi i Teoret.Fiziki, 1957, Vol 32, Nr 1, pp 184-184 (U.S.S.R.)

Received: 3 / 1957   Reviewed: 4 / 1957

ABSTRACT: The use of an electron projector permits the visual measuring of phase transformations on small crystals of the order of from 10^{-4} to 10^{-5} cm in the case of a resolving power of 100 - 20 Å. The investigation of the transformation in such small crystals is in itself interesting because with these dimensions the surface energy must exercise growing influence on transformations. The present work makes use of the usual electron projector developed by MUELLER, which has a zirconium point the monocrystalline end of which served as a test ob-ject. The quality of the vacuum was of particular importance because the oxides, nitrides, or carbides which possibly form with heating, are presenting difficulties with regard to melting and volatility, and therefore do not leave the point in the vacuum.

Card 1/3

Investigation of the Allotropic Transformation α ⇄ β Zr with the Aid of an Electronic Projector.

Although the pressure of the remaining gases in the piston was less than 10^{-8} torr, it was not possible to form an im-pression (similar to the well-known one of a pure wolfram point) of the autoelectronic emission of a smoothed crystal.

The small crystals of the α-Zr (hexagonally tightly packed lattice) were ribbed. The ribbing and the clearly marked granulation of the crystal can be brought into connection in a natural manner with the well-known effect produced on the crystal by an electric field as a result of heating. The graininess of the crystal is apparently connected with the penetration of nitrogen atoms from the residual gases into the surface layer.

For the "purification" of the surface the following measures were taken: 1) A certain destruction of the surface on the occasion of the destruction of the point by the application of a high positive potential. Here the gradient on the sur-face amounts to up to $1,4.10^{8}$ V/cm.

Card 2/3

KOMAR, A.P.

AUTHOR	KOMAR,A.P.,Member of the Academy of Science of the	20-1-16/64
	Ukrainian SSR, and N.I.KRIVKO	
TITLE	The Temperature Dependence of the g-Factor and of the Relaxation	
	Time in the Ferromagnetic Resonance for Some Ferrites.	
	(Temperaturnaya zavisimost' g-faktora i vremeni relaksatsii pri ferro	
	magnitnom rezonanse dlya nekotorykh ferritov-Russian)	
PERIODICAL	Doklady Akademii Nauk SSSR,1957,Vol 114,Nr 1,pp 64-66 (U.S.S.R.)	

ABSTRACT   First of all the paper under review refers to some relevent previous-
ly published papers.Then the authors compute the factor of the spec-
troscopic decomposition g and the relaxation time T with the aid of
known formulae which were adapted to the conditions prevailing in
the experiment described in the paper under review.g and T are de-
termined in this paper for two groups of technological ferrites with
the compositions $NiO.ZnO.Fe_2O_3$ and $Li_2O.ZnO.Fe_2O_3$. These ferrites
were produced by roasting and they contained,at the boundaries of
their grains,reets of oxides.The measurements were conducted at tem-
peratures of 290 and 4.20K and at a frequency of 9.4.109 hertz.The
authors of this paper determined the magnetization curves and the sa-
turation magnetisation for all ferrites investigated by them.The sa-
turation magnetization was achieved at relatively low field intensi-
ties (H<1400 oersted).The ferromagnetic resonance was investigated
with the aid of rectangular and coaxial wave guides.The ferrite discs
were arranged in the wave guide at right angles to the direction of
the magnetic alternating field.The dimensions of the ferrite discs a-

Card 1/2

The Temperature...   laxation Time in the Ferro...
re listed in the paper under review.Each disc had a d...
a diameter of 2mm.The computations and the measurements showed that
...le has no substantial influence on the value of the coeffici-
ents of demagnetisation N_x and N_y,if the discs are thin.It was possib-
le to vary the field intensity of the constant magnetising field from
0 to 26,000 oersted.For the generation of the frequency 8600-9600
magnetic field,a standard apparatus for the measurement of the electro-
megahertz was used. The characteristic curves of absorption and
persion are pictured in diagrams contained in the paper under review.
The data obtained in this context show the following:In a part of the
ferrites investigated,the g-factor changes-if the temperature is re-
duced-by an amount which is larger than the accidental error of measu-
rement of 4 %.As far as the change in the relaxation time is concerned
no general tendency was observed.It is not possible to explain on ba-
sis of the existing microscopic theories the change of the g-factor
at reduction of the temperature.
(3 reproductions,2 charts).

KOMAR, A. P.

KOMAR, A. and SCHREDNIK, V.

"The Investigation of Phase Transformation"

Fourth Int'l Conference on Electron

KOMAR, A. P. and   TALANIN, G.

"The Formation of Carbides on the Surface of W and Mo Single Crystals."

paper submitted for predentation at Fourth Int'l Conference on Electron
Microscopy, Berlin, GFR, 1o-17 Sep 58.

Phyical Technical Institute, USSR Academy of Sciences, XLeningrad.

C-3,800,829,   25 Jul 58.

SOV-120-58-1-20/43

AUTHORS: Komar, A. P. and Chernov, N. N.

TITLE: A High Voltage Multipulse Voltage Generator (Vysokovol'tnyy mnogoimpul'snyy generator napryazheniya)

PERIODICAL: Pribory i Tekhnika Eksperimenta, 1958, Nr 1, pp 82-84 (USSR)

ABSTRACT: The generator was designed to produce short high voltage pulses. The generator may be successfully used in electron microscopy, in semiconductor studies and in work on conductivity. The main requirements were as follows: (1) the generator should give a series of short pulses of 10 - 50 kV; (2) the duration of each pulse should be easily adjustable and lie in the range 0.5 to 3 μs; (3) the maximum number of pulses in series should be not less than 10; (4) the time interval between the pulses should be easily controlled and lie within the range 3 to 5 μs; (5) the repetition frequency should be 50 cps; (6) the envelope of the pulses must be of a given form; (7) the form of each pulse in a series should be sinusoidal or approximately sinusoidal; (8) the

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A High Voltage Multipulse Voltage Generator.

current in each pulse through a load should be of the order of 1 A. The circuit of the generator is a development of a well-known discharge circuit and is shown in Fig.1. The capacitor C charges up to a potential E_A and then dis- charges with the help of the thyratron T through the induc- tance L_1 which is the primary of an ironless transformer. The potential difference across a resistance R in the secondary is applied to the load with the anode earthed. A detailed circuit of the multipulse generator is shown in Fig.2. The series of pulses is produced as follows: the capacitors C_6 are charged from a regulated DC power supply at the output of the rectifiers $Л_1$ (Fig.2). These voltages are up $10 - 15$ kV. If the thyratrons T_2 fire one after another, then the capacitors C_6 will discharge through the primary of the pulse transformer L_1. The secondary of this transformer is connected so that the first peak of the voltage has a negative polarity while the second positive peak is cut off by the valves $Л_5$. The successive

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A High Voltage Multipulse Voltage Generator.

firing of the thyratrons T_2 is ensured by a delay line, shown in Fig.2 (1-10). The signals for the grids of the thyratrons T_2 are tapped off the line at the points 1-10 and are applied to the grids through amplifiers with cathode loads. Experiment has shown that a single cathode repeater does not ensure the firing of the thyratrons. It was found that the signal propagated along the line was considerably disturbed and its amplitude was lowered. This effect was compensated by means of the second cathode repeater $Л_3$.

In the absence of the delay pulse the current in the anode circuit of the thyratrons is zero. The thyratrons fire when a positive pulse with a fast rise time is applied to the delay line from the generator T_1. In order to prevent the firing of all the thyratrons when the first thyratron fires (when a negative impulse appears on L_1 and therefore on the anodes of all the thyratrons), the capacitor C_5 is

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SOV-120-58-1-20/43

A High Voltage Multipulse Voltage Generator. of the delay line. The pulse generator was used over a number of months and was quite stable. There are 2 figures, no tables and no references.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN SSSR (Institute of Physics and Technology   of the Academy of Sciences USSR)

SUBMITTED: June 14, 1957.

1. Pulse generators--Design   2. Pulse generators--Applications
3. Pulse generators--Performance   4. Pulse generators--Equipment

Card 5/5

SOV/120-58-5-3/32

AUTHORS: Komar, A. P. and Stabnikov, M. V.

TITLE: An Investigation of the Effect of Plates on the Sensitive Layer of a Diffusion Chamber (Issledovaniye vliyaniya plastin na chuvstvitel'nyy sloy diffuzionnoy kamery)

PERIODICAL: Pribory i tekhnika eksperimenta, 1958, Nr 5, pp 21-25 (USSR)

ABSTRACT: To study nuclear reactions in diffusion chambers it is necessary to insert into them partitions of different materials. When these partitions are introduced into the sensitive layer of a diffusion chamber, intensive condensation takes place on them. This reduces supersaturation and leads to the formation of a non-sensitive gap near the partitions. At the same time the temperature difference between the plate and the surrounding gas leads to the appearance of convective currents. All this leads to a distortion of the sensitive layer so that the chamber cannot be used successfully. Regozinski (Ref.3) has reported an attempt at the solution of this problem but his method cannot be considered successful. In the present paper a new method

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SOV/120-58-5-3/32

An Investigation of the Effect of Plates on the Sensitive Layer of a Diffusion Chamber

is described whereby lead plates have a negligible effect upon the sensitive layer. It was found that if a lead plate is covered with a metal jacket which is thermally insulated from the plate, then the work of a diffusion chamber is unaffected and the sensitive layer in its upper part approaches the plate (Fig.6a). A similar picture is obtained if the lead plate is cut in two, as was suggested in Ref.3. In this case the non-sensitive zone covers only the lower part of the plate (up to 3 cm). However, the authors have found that the most successful form of a partition wall is the one shown in Fig.3c. Here, 1 is the lead plate, 2 is a textolite screen on either side of the plate with 5 mm holes drilled in it. The two plates are thermally insulated from the lead plate by means of separators, 3. Fig.8 shows the distribution of the sensitive layer near such a plate. As can be seen, in spite of the

Card 2/3

48-22-5-14/22

AUTHORS: Komar, A. P., Talanin, Yu. N.

TITLE: Pictures of Autoelectronic Emission of Crystals of Tungsten Carbide and Molybdenum Carbide (Kartiny avtoelektronnoy emissii kristallov karbidov vol'frama i molibdena)Data on the VIII All Union Conference on Cathode Electronics (Materialy VIII Vsesoyuznogo soveshchaniya po katodnoy elektronike, Leningrad, 17-24 oktyabrya 1957 g.)

ABSTRACT: The authors repeatedly observed in the projector of a field electron microscope (Reference 1-3) a hexagonal-symmetrical picture originating (rarely) from a tungsten tip or (repeatedly) a molybdenum tip. This seemed peculiar as both metals have a body-centered (cubic) lattice. Considering the not very good quality of the vacuum and the possible carbon-containing contamination, the authors expressed the assumption that the picture in question originates from the carbides W_2C and Mo_2C which are formed on the tungsten-and molybdenum-monocrystals and are of a hexagonal structure (Reference 6). As it was not

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Pictures of Autoelectronic Emission of Crystals of   48-22-5-14/22
Tungsten Carbide and Molybdenum Carbide

possible to confirm this latter assumption, the investigations
on the carbides mentioned were continued. The photographs
taken earlier by the authors and by A. P. Kuritsyna were ana-
lysed more carefully. The insufficiencies mentioned above were
removed and another projector (figure 1) was used. The results
leave no doubt that the observed hexagonal crystal presents
a carbide of the described metals. It is now to be determined
which carbide it is. Structure and position of the metal and
the carbon atom is shown in figure 6. Therefrom the angles were
calculated, which are formed by the axis "c" with the verticals
to the most probable facets of both the lattice planes $(11\bar{2}0)$
and $(1\bar{1}00)$. Figure 7 shows the calculation results in diagrams.
From the results the authors assume that the carbides are W_2C and
Mo_2C. This is being confirmed in reference 13. The authors
cannot understand the absence of the carbides WC and MoC, which
should be present at the formation of W_2C and Mo_2C. The nature

of the cubic, "rib-bearing" crystal is not clear either, which
often preceded the hexagonal crystal. I. L. Sokol'skaya, B. G.

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Pictures of Autoelectronic Emission of Crystals of   48-22-5-14/22
Tungsten Carbide and Molybdenum Carbide

Smirnov, N. A. Gorbatyy, G. N. Shuppe and the two authors
took part in the discussion of this paper. There are 11 figures,
1 figure and 2o references, 12 of which are Soviet.

ASSOCIATION: Leningradskiy fiziko-tekhnicheskiy institut Akademii nauk SSSR
(Leningrad Physical-Technical Institute AS USSR)

1. Single crystals--Analysis   2. Crystals--Lattices--Analysis
3. Tungsten carbide crystals--Analysis   4. Molybdenum carbide crystals
--Analysis   5. Electron microscopes--Applications   6. Secondary
emission

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9(3)
AUTHORS: Komar, A. P., Academician of the AS UkrSSR, Korobochko, Yu. S.

TITLE: On Two Processes Favoring the Capture of Electrons Under Betatron Conditions of Acceleration (O dvukh protsessakh, sposobstvuyushchikh zakhvatu elektronov v betatronnyy rozhim uskoreniya)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol 123, Nr 4, pp 643-644 (USSR)

ABSTRACT: Various authors have already suggested mechanisms for the capture of electrons in a betatron (Refs 1-4). However, according to the opinion of the authors of the present paper, two more effects must be considered which may vary the amplitudes of the radial oscillations of the electrons considerably by the capture of part of these electrons. The first effect is shown by a diagram, which represents the orbit of the electron beam in the chamber during a period of the radial oscillations. In this case the orbit around which the radial oscillations happen to develop has the shape of a periodic curve, and its period is equal to that of the radial oscillations. The orbit of the electron is distorted under these conditions. The amplitude of the radial oscilla-

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SOV/120-59-5-7/46

21,5300

AUTHORS: Komar, A.P., Stabnikov, M. V. and Yashin, D. A.

TITLE: A Controlled Diffusion Chamber

PERIODICAL: Pribory i tekhnika eksperimenta, 1959, Nr 5, pp 36-40 + 1 plate (USSR)

ABSTRACT: A description is given of the construction and the working properties of a diffusion chamber controlled by an ionization chamber. The ionization chamber is placed in the sensitive layer of the diffusion chamber and its action depends on the collection of electronic charges. A similar chamber has been briefly described by Block et al. (Ref 3). The diffusion chamber may be used in cosmic ray studies and in accelerator work. When ionizing particles pass through the ionization chamber and the sensitive layer of the diffusion chamber, electrical pulses appear at the output of the amplifier connected to the ionization chamber. The magnitude of each pulse depends on the energy lost by the particle in the gas and also on the working conditions and the construction of the ionization chamber. It is possible to choose pulses of given amplitude and use them to

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SOV/48-23-7-15/31

24(7)
AUTHORS: Kocharov, G. Ye., Komar, A. P., Korolev, G. A., Marov, I. N., Surkov, Yu. A.

TITLE: The Fine Structure of the α-Spectrum of Th^{229} (Tonkaya struktura α-spektra Th^{229})

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1959, Vol 23, Nr 7, pp 855-858 (USSR)

ABSTRACT: The radioactive isotope Th^{229} is obtained by the α-decay of U^{233}; as the half-life of the latter is $1.62 \cdot 10^5$, that of Th^{229}, however, only 7,000 years, a large quantity of U^{233} is necessary for the exact determination of the activity of the isotope Th^{229}. A paper (Ref 1) is mentioned in which the α-decay of this isotope was investigated, but it did not deliver satis- factory results due to a poor resolving power. The present investigation was carried out with an ionization-α-spectrometer of high resolving power, and the chemical production of the isotope from oxides of the isotope U^{233} is described in detail. The isotope U^{233} investigated by the authors contains –

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Investigation of the Non-Steady-State Current
in a Betatron

75331
SOV/57-29-10-8/18

current change. Measurements of this current show it to equal
50 to 60% of the maximum possible value of the orbital current.
In the experiments described, no captured current was observed:
not because it does not exist but because it was too small to be
recorded by the measurement method used. Teumin, M. I., Oks, I.O.,
Kiselev, R. A., and Glushanok, Yu. B., helped in the study.
There is 1 table, 6 figures, and 10 references, 5 Soviet, 4 U.S.,
and 1 British. The U.S. references are: Kerst, ...
7/, ... 1... Kerst, Rev.Sci. Instr., 21, 7..., 19..; Widerde.
J.Appl.Phys., 22, 362, 1951; Dens, Rev. Sci. Inst.,19, 105,
1943. The British reference is: Barden, Proc. Phys. Soc., 64B,
85, 1951.

ASSOCIATION: Leningrad Polytechnic Institute im. Kalinin   (Leningradskiy
              politekhnicheskiy institut im. Kalinina)

SUBMITTED: August 20, 1958

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75333
SOV/57-29-10-10/13

9.3000

AUTHORS:

Vorob'yev, A. A., Ivanov, B. A., Komar, A. P., Korolev, V. A.

TITLE: Influence of Ramsauer-Townsend Effect on the Mobility of Electrons in Spectroscopically Pure Argon

PERIODICAL: Zhurnal tekhnicheskoy fiziki, 1959, Vol 29, Nr 10, pp 1252-1258 (USSR)

ABSTRACT: The purpose of the paper is to verify the influence of Ramsauer-Townsend effect on the mobility of electrons in spectroscopically pure argon. The study is experimental in nature. The drift of electrons is measured as a function of E/p, where E is intensity of the electric field and p is barometric pressure of argon in the experimental chamber. The experiments were carried out for values of E/p between 0.001 and 1.5. At small values of E/p a maximum was observed similar to that obtained by other investigators. This maximum could be explained as the result of the Ramsauer-Townsend effect, or it might have been caused by the excitation of molecular levels owing to the presence of impurities in argon. For this reason industrial argon of 99.6% was also used. The ionization chamber was filled with argon at

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21(8)
AUTHOR: Kocharov, G. Ye., Komar, A. P.,
                 Korolev, G. A.

TITLE: Energy Spectra of α -Particles of Long ..... Th^{232} and U^{238}
                 Isotopes (Energeticheskiye spektry α -chastits dolgozhivush-
                 chikh izotopov Th^{232} i U^{238})

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959,
                 Vol 36, Nr 1, pp 68-75 (USSR)

ABSTRACT: Investigation of α -spectra fine structure makes it possible
                 to investigate the weakly excited states of heavy nuclei as
                 well as the determination of several parameters of nuclear
                 structure. As the magnetic spectrometers otherwise used are
                 not suited for fine-structure investigations of α -spectra of
                 long-life isotopes because of their low light intensity, and
                 as the usual ionization chambers furnish a half-width of lines
                 of only ~50 keV, the authors endeavored to produce a device
                 having a better resolving power. In 1955 and 1956 they develop-
                 ed an ionization chamber in their laboratory, which had a grid
                 for an α -line half-width of 30 keV (Refs 1-4), with the help
                 of which it was possible to carry out an investigation of the
                 fine structure of the α -spectra of Th^{232} and U^{238}. The present
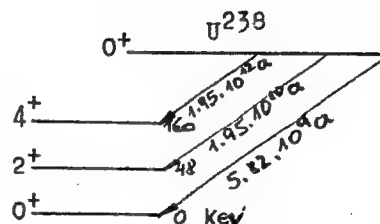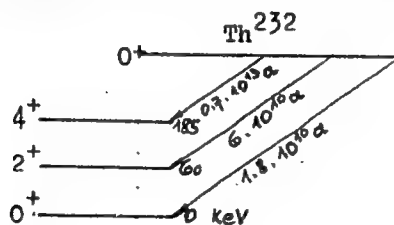
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                 paper gives a very detailed description of the device and of
                 its mode of operation. The following was investigated:
                 1) The α -transition to the first excited level of the
                 daughter-nuclei of Ra^{228} and Th^{234}. Figure 4 shows the
                 α -spectrum of Th^{232} (measuring time 25 hours), and figure 5
                 shows that of U^{238} (1.5 hours). For the former an α_1-intensity
                 of (23±3) % is given, as well as an energy of the first level
                 of (60±5) keV, for U^{238} an α_1-intensity of (23±4) % and an
                 energy of the corresponding level of (48±5) keV.
                 2) Transition to the second level of the daughter nuclei of
                 Ra^{228} and Th^{234}. Figure 6 shows N(E) for Th^{232} (measuring
                 time 90 hours). Owing to the great light intensity and the
                 good resolving power of the ionization chamber, the spectrum
                 shows distinct peaks for $\alpha_1(2^+)$ and $\alpha_2(4^+)$. Figure 7 shows a
                 similar spectrum for U^{238} (30 h). The following data are given:
                 Energy of the second level (185±5) keV, intensity (0.2±0.08) %
                 and (160±5) keV intensity (0.23±0.07) % respectively.
                 A comparison between experimental data and those calculated by
                 Nosov (Ref 17) and Komar et al (Ref18) shows good agreement

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Energy Spectra of α-Particles of Long-Life   Th^{232} SOV/56-36-1-11/62
and U^{238} Isotopes

(see table). In conclusion, the following decay schemes are
suggested for Th^{232} and U^{238}:

Th^{232}

0+		
4+	185	0.7·10⁵ α
2+	60	6·10¹⁰ α
0+	0 keV	1.8·10¹⁶ α

U^{238}

0+		
4+	160	1.95·10¹² α
2+	48	1.95·10¹⁰ α
0+	0 keV	5.82·10⁹ α

In conclusion, the authors thank Yu. A. Surkov for placing
the thorium sources at their disposal, V. G. Nosov for dis-
cussions and for placing the manuscript of his paper at their
disposal, and they further express their gratitude to

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Energy Spectra of α-Particles of Long-Life   Th^{232} SOV/56-36-1-11/62
and U^{238} Isotopes

Ye. A. Damaskinskiy for his assistance and to V. A. Kireyev
and S. N. Nikolayev for their advice. There are 8 figures,
1 table, and 21 references, 10 of which are Soviet.

ASSOCIATION: Leningradskiy fiziko-tekhnicheskiy institut Akademii nauk SSSR
(Leningrad Physico-Technical Institute of the Academy of
Sciences, USSR)

SUBMITTED: August 8, 1958

Card 4/4

24(7)
AUTHORS:

Vorob'yev, A. A., Komar, A. P., Korolev, V. A., SOV/56-37-2-32/56
Solyakin, G. Ye.

TITLE:

The α-Spectrum of the Natural Mixture of Isotopic Samarium

PERIODICAL:

Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959,
Vol 37, Nr 2(8), pp 546 - 548 (USSR)

ABSTRACT:

In the present "Letter to the Editor" the authors report on
investigations of the α-spectrum of Sm^{147} and the isotopic
mixture by means of a pulse ionization chamber; the chamber
was filled with chemically pure argon (99.9% Ar, $+O_2$, N_2...).
The measured α-spectrum of Sm^{147} is shown by figure 1; it had
a half width of 43 kev (when intensive α-emitters, as e.g.
U^{234}, were used, the half width amounted to 50 kev). The energy
of the α-particles of Sm^{147} was determined as amounting to
(2.19 $\pm$ 0.01) Mev, which agrees well with the value mentioned
in reference 6. Figure 2 shows the spectrum of the α-particles
of the natural isotopic mixture (without collimation) within

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The α-Spectrum of the Natural Mixture of Isotopic Samarium SOV/56-37-2-32/56

the energy interval of 2.0 - 2.8 Mev. The energy of the α-particles of Sm^{146} is (according to reference 7) equal to ~ 2.55 Mev; knowledge of this fact and of the entire background (within the range of 1.5 - 2.5 Mev - 1 pulse/hour) makes it possible to evaluate the upper limit of the Sm^{146}-content in the natural isotopic mixture and thus to determine the half lives: $T(Sm^{147}) = 10^{12}$ a and $T(Sm^{146}) = 5.10^{7}$ a. The Sm^{146}-concentration in the natural isotopic mixture is not greater than $2.5.10^{-6}$ % (the number of α-particles originating from Sm^{146}-decay does not exceed the background). According to a mass-spectrometric analysis the content would amount to 8.10^{-5} % (Ref 8). There are 2 figures and 8 references, 1 of which is Soviet.

ASSOCIATION: Leningradskiy fiziko-tekhnicheskiy institut Akademii nauk SSSR (Leningrad Physico-technical Institute of the Academy of Sciences, USSR)

SUBMITTED: March 26, 1959

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-24 (5), 18 (7)

AUTHORS: Komar, A. P., Academician, AS UkrSSR,   SOV/20-125-3-17/63
Volkenshteyn, N. V., Fedorov, G. V.

TITLE: The Change of the Sign of the Constant of Hall in the Ordering of Atoms in an Alloy (Izmoneniye znaka postoyannoy Kholla pri uporyadochenii atonov v splave)

ABSTRACT: The authors first mention some previous papers on this subject. The alloy Ni_3Mn is characterized by a dependence of its electric and galvano-magnetic properties on the spontaneous magnetization I_s and on the degree of the long-range order η. This dependence discerns this alloy from pure ferromagnetic metals and also from binary alloys of similar structure and composition. The Hall electromotive force E_H of the alloys Ni_3Mn was investigated for the cases of different heat treatment of the used samples in a wide temperature range down to the temperature of liquid helium. According to these investigations, E_H strongly depends

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The Change of the Sign of the Constant of Hall in the   SOV/20-125-7-17/55
Ordering of Atoms in an Alloy

on the manner of fixing the investigated state of the alloy.
Even in the case of fixing the non-ordered state (hardening
from high temperatures), the different rate of hardening
exerts a great influence. If the alloy is quickly cooled
from 800° to room temperature, the alloy is paramagnetic
at this temperature. The Hall constant of this sample was

positive and equal to $R_0 = + 0.09 \cdot 10^{-12}$ v. cm/a. gauss.

In the case of ferromagnetics, v_H (it seems to denote the

Hall potential) is calculated according to the formula

$v_H = \dfrac{R_0 Bi}{d} + \dfrac{R_s \cdot 4\pi I_s i}{d}$. R_0 denotes the ordinary Hall constant

and R_s the Hall constant connected with the spontaneous

magnetization I_s. R_s has an unusual, non-classical, positive

sign. This fact agrees also with the results of American
authors (Ref 7). The Hall electromotive force, which is due
to the existence of I_s, was found only at low temperatures.

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The Change of the Sign of the Constant of Hall   SOV/20-125-3-17/65
in the Ordering of Atoms in an Alloy

A diagram shows the curves for the dependence of E_H on B
for a sample of Ni_3Mn of ordered grouping ($\eta \sim 1$) of the
atoms. In this case, R_s is equal to $-0.637.10^{-12}$ v.cm/a.gauss.

The diagram contains also the similar curves for the sample
if the degree of the long-range order is lower than 1.
All the curves plotted for such a treatment of the alloy
show a noticeable decrease of E_H if B increases. E_H passes
through the value zero at the temperatures of liquid
nitrogen and liquid helium. In the case of partially
ordered states or of a mixture of ordered and non-ordered
phases, E_H and v_H may be determined according to the above-
mentioned formula. In the way discussed in the present
paper, the shape of all the curves shown in the diagram may
be qualitatively explained. There are 1 figure and
10 references, 6 of which are Soviet.

Card 3/3   Inst. Physics of Metals AS USSR,
Physics-Tech Inst AS USSR

21(7)
AUTHORS:

Komar, A. P., Academician, Dragnev, T. N.   SOV/20-126-6-23/67

TITLE:

·The Fine-structure of the Energy Spectrum of Photoprotons From Ca^{40} (Tonkaya struktura energeticheskogo spektra fotoprotonov iz Ca^{40})

PERIODICAL:

Doklady Akademii nauk SSSR, 1959, Vol 126, Nr 6, pp 1234-1235 (USSR)

ABSTRACT:

The energy- and angular distribution of photoprotons were investigated by the aid of photoemulsions NIKFI-22 (200μ) which were irradiated by γ-rays of the synchrotrone of the Fiziko-tekhnicheskiy institut AN SSSR (Physico-technical Institute of the AS USSR), the maximum γ-energy amounting to 85 Mev. The energy distribution shown in figure 1 was worked out according to the method by Ye. P. Ferreyra and P. Ya. Valoshek. The form of energy distribution, especially the peaks in the range of 9.5 to 12 Mev, are explained by the assumption that absorption of γ-quanta leads to the production of intermediate nuclei. The "plateau" in the range of from 7.5 to 9.5 Mev is explained by the appearance of photoprotons which correspond to the transitions of excited Ca^{40} levels to the first excited levels

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The Fine-structure of the Energy Spectrum of
Photoprotons From Ca^{40}

SOV/20-126-6-23/67

of K^{39}. The functions developed by the method of the least
squares for the angular distribution of photoprotons in
various energy ranges between 3.4 and 10.8 Mev are specified,
and by way of a conclusion it is stated that the considerable
differences in the anisotropy of the angular distribution of the
protons in the energy ranges (3.4 - 9.5 Mev) and (9.5 - 15 Mev)
agree with the suggested explanation of the fine-structure.
There are 1 figure and 2 references, 1 of which is Soviet.

ASSOCIATION: Fiziko-tekhnicheskiy institut Akademii nauk SSSR
(Physico-technical Institute of the Academy of Sciences, USSR)
Leningradskiy politekhnicheskiy institut im. M. I. Kalinina
(Leningrad Polytechnic Institute imeni M. I. Kalinin)

SUBMITTED: April 18, 1959

Card 2/2

18 (7), 24 (2) 18.9100

AUTHORS: Komar, A. P., Academician, Academy of   66450
Sciences, Ukrainskaya SSR, Savchenko, V. P., Shrednik, V. N.   SOV/20-129-3-18/70

TITLE: The Electron Autoemission Images of Crystals of Orderable Alloys

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 129, Nr 3, pp 540-543 (USSR)

ABSTRACT: New methods ought to be developed for the production of
electron-autoemission images of metals with a melting point of
less than 1500°. The method suggested by A. J. Melmed and
R. Gomer (Ref 1) is suited only for pure metals. The authors
developed a simpler and more universal method for the production
of electronic autoemitters, which are suited for various
single-phase metallic systems with a melting point of less than
1500°. By means of the usual production process using a vacuum
breakdown the authors obtained projections on the surface of
the tip on which autoelectronic emission occurs. The
projections having a height of some hundreds Å have good contact
with the tip and are therefore easily heated. In metals or
alloys which have a higher vapor pressure $(p > p_{Ni})$ at room
temperature, breakdown in the vacuum is easily produced.

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The Electron Autoemission Images of Crystals of
Orderable Alloys

66450
SOV/20-129-3-18/70

Several figures show typical electron images recorded
immediately after breakdown in the vaccum. The emission of
electrons is the same for nearly all parts of the "pimples".
In addition to the roughness of the surface, deep holes in the
layers of the "pimples" occur on the surface. In the figures
round, black spots correspond to these holes, which are
displaced with the entire figure under the influence of a
magnetic field. The homogeneity of the emission and the holes
in the surface of the "pimples" show that the structure of the
"pimples" within the limits of the resolving power of the
electron projector is amorphous. Heating the points consisting
of Ni_3Mn and $AuCu_3$ alloys to 40 to 60°, signs of a
crystallographical limitation of the "pimples" occur. The
equilibrium images resulting from an intense heating of the
alloys Ni_3Mn, $AuCu_3$, $PtCu_3$ and the pure metals Ni and Au
indicate that the "pimples" are well-bounded crystals. For the
definite and final determination of the structure of the
initial surface the authors intend carrying out investigations
by means of an ion projector. In the alloy Ni_3Mn the diffusion

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21.5200
21 (3)

67259

SOV/20-129-4-21/68

AUTHORS: Komar, A. P., Academician of the Academy
             of Sciences, Ukrainskaya SSR, Stabnikov, M. V.

TITLE: The Variation of Pressure in a Diffusion Chamber Due to the
             Occurrence of Tracks, and the Possibilities of Its
             Utilization

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 129, Nr 4, pp 793 - 794
             (USSR)

ABSTRACT: The sensitive volume of a diffusion chamber is usually filled
             with an oversaturated mixture of oversaturated vapors of the
             operational liquids and a gas. The operational liquids used
             are, above all, ethyl- or methyl alcohol, and according to the
             purpose for which the experiment is carried out any type of gas
             may be used. The partial gas pressure in the chamber is con-
             siderably higher than the partial pressure of the vapors of the
             operational liquid. In the course of the condensation of part
             of the vapor during production of the track in the sensitive
             layer, the latent condensation heat is emitted, the gas will
             become heated and pressure will increase. The "lifetime" of the
             increased pressure depends upon the rate of heat emission from
             the interior of the chamber. When using a microphone transmitter,

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67259

The Variation of Pressure in a Diffusion Chamber Due   SOV/20-129-4-21/68
to the Occurrence of Tracks, and the Possibilities of
Its Utilization

the variation of pressure with respect to time may be recorded.
The corresponding curve is illustrated in a diagram. Pressure
variation in the chamber during production of a track of α-par-
ticles with an energy of 8 Mev is of the order of 10^{-6} mm Hg.
This pressure variation may serve for the control of photograph-
ing the tracks with a previously determined ionization. The cor-
responding wiring diagram is shown in a figure. The position of
the drop was recorded by means of a photoelectric resistor of
the type FS-K1. The variations of temperature and gas pressure
in the chamber are proportional to the particle energy if the
entire track is located within the chamber. Thus, the particle
tracks of a certain energy or nature, stars etc., may be selec-
tively photographed by means of a device shown in a figure even
in the presence of a background of α-radiation or of electrons.
As the primary element for the pressure pulse is considerably
more simple than e.g. an ionization chamber, the method sug-
gested in this paper may be employed for the discrimination of

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67259

The Variation of Pressure in a Diffusion Chamber Due
to the Occurrence of Tracks, and the Possibilities of   SOV/20-129-4-21/68
Its Utilization

tracks in any laboratory. There are 2 figures and 1 Soviet
reference.

ASSOCIATION: Fiziko-tekhnicheskiy institut Akademii nauk SSSR (Institute of
Physics and Technology of the Academy of Sciences, USSR)

SUBMITTED: July 16, 1959

Card 3/3

67259

The Variation of Pressure in a Diffusion Chamber Due
to the Occurrence of Tracks, and the Possibilities of   SOV/20-129-4-21/68
Its Utilization

         tracks in any laboratory. There are 2 figures and 1 Soviet
         reference.

ASSOCIATION: Fiziko-tekhnicheskiy institut Akademii nauk SSSR (Institute of
             Physics and Technology of the Academy of Sciences, USSR)

SUBMITTED: July 16, 1959

Card 3/3

26.2312
9.3120 (1003, 1137, 1140)

S/109/60/005/008/003/024
E140/E555

AUTHORS: Komar, A.P., Savchenko, V.P. and Shrednik, V.N.

TITLE: Adsorption, Migration and Evaporation of Be Deposited on W monocrystal

PERIODICAL: Radiotekhnika i elektronika, 1960, Vol.5, No.8, pp.1211-1217

TEXT: The system Be-W is of interest for several reasons. Be is an alkali-earth metal and Be films should reduce the W work function; published measurements of Be work function date back 20 years; and the study of Be on W monocrystal would permit verification of Drechsler's calculations (Ref.7) concerning migration and evaporation of atoms on W monocrystals for the region of small adsorbate atomic radii.   A study was accordingly carried out, using a Müller projector (Ref.8). Emission patterns were obtained showing the migration of beryllium over a tungsten monocrystal (Fig.1), the behaviour of thick films (Fig.2) and evaporation (Fig.3). It was found that Be work function is higher than that of W. (Preliminary results give $\varphi_{Be} = 5$ eV). It was further found that the work function of W is either increased or decreased by a beryllium monolayer, in dependence on crystallographic direction.
Card 1/2

9.3120 (1003,1137, 1140)

AUTHORS: Komar, A.P., Savchenko, V.P. and Shrednik, V.N.

TITLE: A New Method of Preparing Field Emitters From
             Low-melting Point Metals and Alloys

PERIODICAL: Radiotekhnika i elektronika, 1960, Vol. 5,
             No. 8, pp. 1342 - 1346

TEXT: Field emitters of Ni_3Mn and similar materials have
been prepared by the use of vacuum breakdown in a projector
tube between a point of the investigated material (negative
electrode) and the screen (positive electrode). A resistive
or inductive element is used to restrict the breakdown to a
local breakdown. This resulted in the formation of
protuberances. A number of field emission patterns obtained
in the projector tube are reproduced.
There are 3 figures and 7 references: 2 Soviet and
5 non-Soviet.

Card 1/2

Card 2/2

83673

S/048/60/024/009/006/015
BO(3)/B063

24.6810

AUTHORS: Vorob'yev, A. A., Komar, A. P., Korolev, V. A.

TITLE: Investigation of the Alpha Decay *19* of U^{235} by Means of an
Ionization Alpha Spectrometer

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1960,
Vol. 24, No. 9, pp. 1092-1098

TEXT: The present paper contains the results of an investigation of the
α-decay of U^{235}, which was carried out by means of an ionization α-
spectrometer. The spectrometer was tuned to a γ-spectrometer. The authors
studied a spectrum without coincidence with γ-quanta (Figs. 1 and 2) and
a series of γ-spectra coinciding with different groups of alpha particles
(Figs. 3 and 4). A source enriched in U^{235} was used for the measurement.
The spectral line of U^{234} (98%) showed, however, the highest intensity.
It was used to stabilize the amplification factor of the amplifying part
of the α-spectrometer. Besides, this line served as a standard for the

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83673

Investigation of the Alpha Decay of U^{235} S/048/60/024/009/006/015
by Means of an Ionization Alpha Spectrometer   B00λ/B06λ

measurement of the energies of U^{235} alphas. The energies, intensities, and forbiddances of the alpha groups are given in Table 1. The results of the analysis of the U^{235} α-spectrum agree with the results of Ghiorso although the latter are only of a qualitative character. The α-spectrum of U^{235} has been recently studied by S. A. Baranov and A. G. Zelenkov by means of a spectrometer of high luminous power. The energies of the lines they found are fairly consistent with the data obtained by the present authors. Table 2 gives the results of the determination of multipole or γ-transitions. On the basis of measurements of α- and γ-spectra, the authors suggest a possible α-decay scheme of $U235$ (Fig. 5). The levels were identified with the help of Nilsson's scheme. Though this identification cannot make a claim to finality, it does not contradict the experimental data available at present. The authors thank S. A. Baranov and A. G. Zelenkov for discussions and information, as well as M. F. Sobolevskaya for her assistance in the measurements. There are 5 figures, 2 tables, and 9 references: 3 Soviet, 3 US, and 1 Danish.

Card 2/2

·21.2000

77325
SOV/57-30-1-4/18

AUTHORS: Denisov, S. G., Ivanov, D. P. , Komar, A. P., Korobochko, Yu. S.

TITLE: Investigation of Electron Distribution in a Batatron Vacuum Chamber

PERIODICAL: Zhurnal tekhnicheskoy fiziki, 1960, Vol 30, Nr 1, pp 31-36 (USSR)

ABSTRACT: The authors devised experiments to investigate the space charge distribution over the cross section of the chamber. During the injection time the electron distribution was studied with a fixed magnetic field while the distribution of the trapped electrons was studied during the work of the betatron and in the presence of γ-rays. All measurements were done on the betatron of the Leningrad Politechnic Institute (Leningradskiy politekhnicheskiy institut), with a maximum γ-ray energy of 15 mev. (1) Investigations of electron distribution over the chamber cross section at injection time: The block diagram is on Fig. 1. The probe is a molybdenum wire

Card 1/9

Investigation of Electron Distribution in
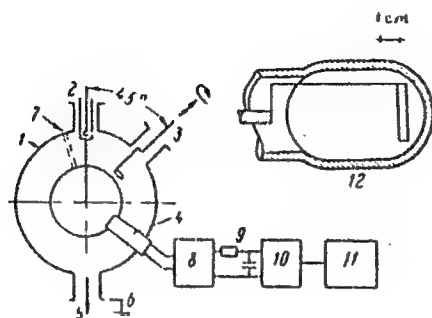a Batatron Vacuum Chamber

77325
SOV/57-30-1-4/18

Fig. 1. (1) vacuum chamber;
(2) injector; (3) probe;
(4) coil; (5) pump connec-
tions; (6) grounding of
the conducting coating of
the chamber; (7) slit in
the conducting coating;
(8) and (10) preamplifier
and amplifier; (9) inte-
grating circuit; (11)
oscillograph; (12) diagram
of the probe position in
the chamber.

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Investigation of Electron Distribution in   77325
a Batatron Vacuum Chamber   SOV/57-30-1-4/18

1.2 mm in diameter, with a 5 x 25 mm^2 stainless steel plate
at the end. The current in the chamber is reduced by
the amount of the charge caught by the probe, and this
quantity is proportional to the density of electrons
at the position of the probe. The size of the current
is measured by means of a coil, wound around the
chamber, whose signal after amplification and time
integration is fed to the input of an oscillograph
with slave scanning. The input signal is, at every
moment, proportional to the instantaneous magnitude
of the nonstationary current in the chamber. The
apparatus registers the current distribution at the
moment when the radius of the injected electrons is
near the geometrical center of the cross section of
the chamber. The injection impulse was nearly equal
to a half-wave of a sinusoid of approximately 40 μ sec
duration and of an amplitude 4 to 8 kv. Prior to
measurements the injector is always adjusted to yield
a maximum value of the nonstationary current for the
given emission from the injector. Figures 2a and 2b

Card 3/9   represent the decrease in the nonstationary current, I,

Investigation of Electron Distribution in
a Batatron Vacuum Chamber

77325
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as a function of the position of the probe. Curves are
obtained for emission currents varying between 7 and 30%
of the calculated limiting current. The authors explain
that the variation in I/I_{max} with the injection current
intensity, is due to the registration procedure they
have chosen and not due to processes occurring in the
camera. Figure 2b shows two clear minimums correspond-
ing to the first and second electron revolution in the
chamber. From the position of these and the position
of the filament, the authors obtain 0.69 for the effec-
tive value of n over the gap width, and for the angle
between the circle tangent to the filament and the direc-
tion of the beam axis, a value $\theta = -2.2^o$. This yields
the beam regions for the first five turns plotted at
the top of Fig. 2b., where the trapping angle for the
beam is limited by the width of the chamber to 8.8^o.
Compared to this, the width of the minimum shows that
the actual trapping width corresponds to a $\theta' = 4.5^o$.
These regions are shown by thick lines on Fig. 2b.

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Investigation of Electron Distribution in   77325
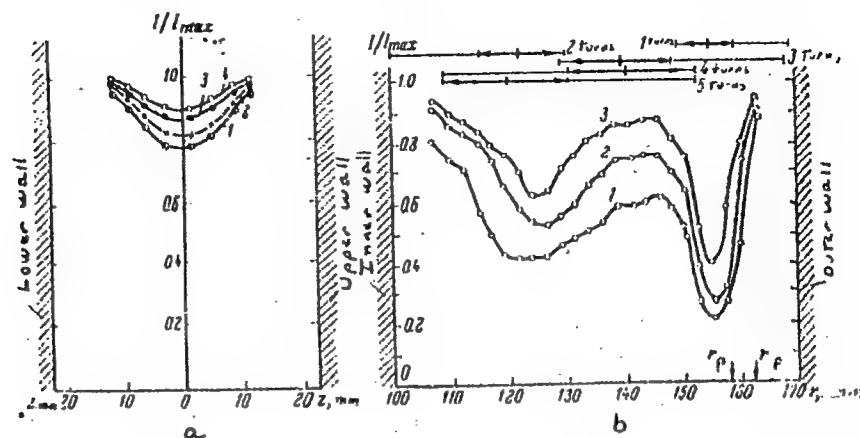a Batatron Vacuum Chamber   SOV/57-30-1-4/18

Fig. 2. (a): (1) $I_{em} = 0.07\ I_{lim}$; (2) $I_{em} = 0.16\ I_{lim}$;
(3) $I_{em} = 0.25\ I_{lim}$; (4) $I_{em} = 0.3\ I_{lim}$ (b): (1) $I_{em} = 0.07$
I_{lim}; (2) $I_{em} = 0.16\ I_{lim}$; (3) $I_{em} = 0.3\ I_{lim}$. r_f and r_p
are radial coordinates of the injector filament and in-
jector point nearest the orbit (similar in Fig. 4b).

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Investigation of Electron Distribution in   77325
a Batatron Vacuum Chamber   SOV/57-30-1-4/18

Attempts to measure the probe current fail, mostly
because of secondary electron emissions. (II) Distribu-
tion of trapped electrons: While the probe in the
stationary magnetic field is almost completely trans-
parent to electrons, which made some 10 turns, during
the working cycle of the betatron the probe becomes com-
pletely opaque when at the place of the equilibrium
radius, as seen in Fig. 4a and 4b. Figure 4b shows that
electrons occupy practically the entire width of the
chamber, and the largest electron current density
is in the equilibrium region. This takes place also
during the accelerating cycle. Detecting the γ -rays
generated by means of a scintillation detector, the
authors found rays of 4-5 mev energy hitting the probe
during the acceleration process. The authors do not
know the exact cause of the step to the left of the
minimum of the equilibrium radius. They speculate that
there may be two trapping orbits, or that for some
values of the instantaneous radius and radial oscilla-
tion amplitudes, there may be a resonance value of 0.75

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Investigation of Electron Distribution in
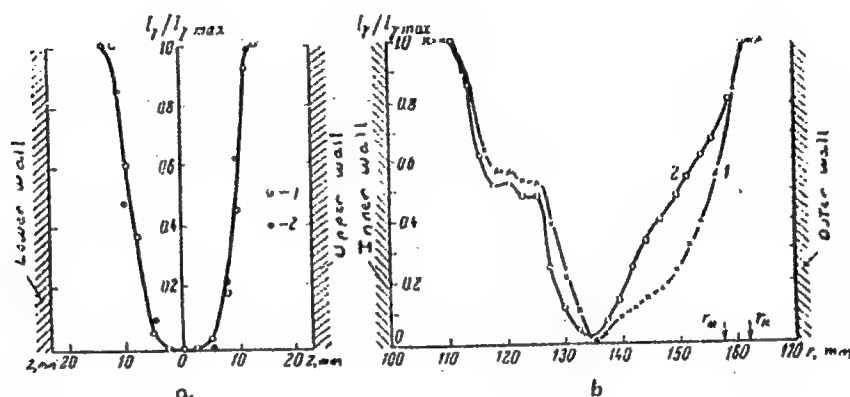a Batatron Vacuum Chamber

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SOV/57-30-1-4/18

Fig. 4. (a): (1) energy of accelerated electrons, 5
mev; (2) energy of accelerated electrons, 15 mev; (b):
(1) electron throw-off on external target; energy of
accelerated electrons, 5 mev; (2) electron throw-off
on inner wall of the chamber; energy of accelerated
electrons, 5 mev.

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Investigation of Electron Distribution in
a Batatron Vacuum Chamber

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SOV/57-30-1-4/18

for the effective value of n. The difference in shape
of curves 1 and 2, Fig. 4b, is due only to the fact that
when the back side of the injector is used as the
target, the γ-rays from the probe (which is also a
target for electrons, see Fig. 3) miss the ionization
chamber. There are 4 figures; and 3 Soviet references.

ASSOCIATION: Physico-Technical Institute AS USSR, Leningrad C. (Fiz-
iko-tekhnicheskiy institut AN SSSR, g. Leningrad)

SUBMITTED: July 20, 1959

Card 8/9

KOMAR, A.P., MIKHAYEV, G.F., FOMINENKO, V.P., CHERNOV, N.N.

New methods for investigating the process of injection of electrons into the betatron. Zhur. tekh. fiz. 30 no.7:855-859 Jl '60.
(MIRA 13:8)

1. Fiziko-tekhnicheskiy institut AN SSSR, Leningrad.
(Betatron)

84564

S/057/60/030/011/009/009
B006/B054

9.6150
21.5300 (1033, 1518)

AUTHORS: Komar, A. P. and Kruglov, S. P.

TITLE: A Quantum Meter for Measuring the Bremsstrahlung Energy
              Flux From Betatrons and Synchrotrons, and Its Investigation
              at $E_{\gamma max} < 100$ Mev

PERIODICAL: Zhurnal tekhnicheskoy fiziki, 1960, Vol. 30, No. 11,
              pp. 1369-1380

TEXT: The demands made on an instrument for measuring bremsstrahlung
energy flux are theoretically met by the new quantum meter developed
by Wilson (Ref. 7). Wilson tested the instrument in the $E_{\gamma max}$ range from
300 to 800 Mev. The present paper gives the results of quantum meter tests
in the range $E_{\gamma max} < 100$ Mev, in which the independence of the instrumental
factor on $E_{\gamma max}$ and on the diameter of the gamma beam at the input of the
instrument is not so clear as at high energies. The authors also give a
mathematically accurate theory for the quantum meter which was missing

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84564

A Quantum Meter for Measuring the Bremsstrahlung   S/057/60/030/011/009/009
Energy Flux From Betatrons and Synchrotrons,   B006/B054
and Its Investigation at $E_{\gamma max} < 100$ Mev

in Ref. 7. In chapter I, they describe the operation of the quantum meter
and the theory of transition curves, and discuss its use for energy flux
measurement. The design of the quantum meter is illustrated in Fig. 2,
and the instrumental factor (for argon, CO_2, and air filling) is thorough-
ly calculated. Table 3 compares the theoretical and experimental instru-
mental factors (for argon and air) in 10^{18} Mev/coulomb units. Chapter II
describes the methods and results of the authors' experiments. Fig. 6
shows the experimental arrangement. First, the authors studied the de-
pendence of the sensitivity of the quantum meter on a parallel shift of
its axis with respect to the beam axis (Curve 1, Fig. 7). The curve ob-
tained is symmetrical, and shows a minimum when displaced by about 7 cm.
For comparison, the authors give the curve measured by Wilson at
$E_{\gamma max}$ = 800 Mev (Curve 3), as well as the curve obtained from an improved
quantum meter; this curve (2) shows no minimum. The diagram of Fig. 8
illustrates the sensitivity of the instrument as a function of the angle
of rotation round the beam axis. Fig. 9 shows $I_K/I_C = B(E_{\gamma max})/A$, where
I_K/I_C is the ratio of the currents of the quantum meter and of the stand-
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84564

A Quantum Meter for Measuring the Bremsstrahlung   S/057/60/030/011/009/009
Energy Flux From Betatrons and Synchrotrons,   B006/B054
and Its Investigation at $E_{\gamma max} < 100$ Mev

ard; $B(E_{\gamma max})$ is the constant of the standard for a given $E_{\gamma max}$, and
A is the instrumental factor of the quantum meter (Table 3). Finally,
the results are discussed in chapter III. The most important result of
experiments made in the range $E_{\gamma max} = 53 \div 85$ Mev was that A showed

a very small energy dependence, even at lower energies. At $E_{\gamma max} = 300$ Mev,

for example, A is only 4.5% smaller than at $E_{\gamma max} = 85$ Mev. Some explana-

tions are offered for the increase of A with decreasing $E_{\gamma max}$. I. Tamm

and S. Z. Belen'kiy are mentioned. There are 9 figures, 3 tables, and
20 references: 5 Soviet, and 15 US.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN SSSR Leningrad
               (Institute of Physics and Technology of the AS USSR.
               Leningrad)

SUBMITTED: March 25, 1960

Card 3/4

83570

S/056/60/038/005/003/050
B006/B070

24.6600
26.2211

AUTHORS: Bochagov, B. A., Komar, A. P., Solyakin, G. Ye.

TITLE: The Kinetic Energy of the Photofission Fragments of U^{238}

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960,
Vol. 38, No. 5, pp. 1374-1380

TEXT: The authors report on investigations of the photofission of heavy
nuclei, particularly U^{238}, carried out with the help of two pulsed ioniza-
tion chambers. A block diagram of the experimental arrangement is shown in
Fig. 1. The synchrotron of the FTI AN SSSR (Institute of Physics and
Technology of the AS USSR) supplied 70 Mev gamma radiation. Uranyl nitrate
in the natural isotopic composition in the form of a deposit on a cellu-
lose film served as the target. The film was covered on both sides by
thin sheets of aluminum. The thickness of the film together with that of
the aluminum was 30 µg/cm^2. The thickness and the homogeneity of the
uranyl-nitrate film were determined from the alpha spectrum of the natural
uranium. Fig. 2 shows this spectrum taken from the side of uranyl nitrate.
The thickness of the uranyl-nitrate film was 320 µg/cm^2. According to

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The Kinetic Energy of the Photofission
Fragments of U^{238}

S/056/60/038/005/003/050
B006/B070

I. V. Chuvilo (Ref. 9), the fragment yield is due to U^{238} fission with an
accuracy of 1% when uranium targets of natural isotopic mixture are used.
In the experiments, every fission event is characterized by the energies
E_1 and E_2 (corresponding to whether it was recorded in the first or in the
second chamber). The distribution of the individual events in (E_1, E_2)
is shown in Fig. 3 (contour diagram) as "horizontal" surfaces
$W_{ik}(E_1,E_2)$, where $W_{ik} = n_{ik}/n_{ik\ max}$, and n is the number of events. The
remarkable thing about the surfaces $W_{ik}(E_1,E_2)$ is their symmetry for re-
flection at the vertical plane containing the principal diagonal $(E_1=E_2)$.

This symmetry shows the same emission probability of light and heavy
fragments for a given direction. It follows from Fig. 3 that the most
probable values of the energies of the fragments are 87 and 61 Mev. Fig. 4
which shows the fragment yield as a function of the masses $m_2/m_1 = E_1/E_2$,
gives the value of the most probable mass ratio as 1.36. It is seen, there-
fore, that the ratio of the most probable masses (1.43) is not equal to the

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83570

The Kinetic Energy of the Photofission   S/056/60/038/005/003/050
Fragments of U^{238} B006/B070

most probable mass ratio. (The same is true also of the neutron-induced
fission of U^{235} and U^{233}.) The W_{ik} surfaces are further characterized by
the two symmetrically lying "hillocks" with "ridges" parallel to the
coordinate axes. These diagrams have analogous forms for the neutron-
induced fissions of other heavy nuclei. Fig. 5 shows the spectra of the
total (kinetic) energy $\Sigma E = E_1 + E_2$ for different E_1/E_2; Fig. 6 shows
the spectrum $\Sigma E = f(N)$. The peculiarities of the curves are discussed.
Fig. 7 shows the fragment distribution $N = f(E_1)$; Fig. 8 shows the same
for three different ranges of ΣE. These distributions have always two
maxima of nearly the same height. The most probable value of ΣE is
150 ± 2 Mev, the half widths of the high and low energy peaks are 17 and
19 Mev, respectively. The measured values and also those obtained after
correction for the source thickness and ionization defects are collected
in a table. Yu. Morozov and B. K. Gormin are thanked for technical
assistance. There are 8 figures, 1 table, and 13 references: 6 Soviet,
4 US, 2 Canadian, and 1 German.

Card 3/4   Leningrad Phys-Tech Inst AS USSR

24.6600
26.2222

S/056/60/038/005/052/057/XX
B006/B070

AUTHORS: Komar, A. P., Korolev, G. A., Kocharov, G. Ye.

TITLE: Study of the Alpha Decay of U^{236} /9

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960,
   Vol. 38, No. 5, pp. 1436 - 1438

TEXT: The alpha spectrum of U^{236} was studied by means of a high resolu-
tion ionization chamber with grid. This chamber permits to determine the
number of ion pairs formed by the alpha particles in the chamber. The ion
pair number N and the alpha particle energy E are related by the equation
$E = Nw$, where w is the energy required for the formation of an ion pair.
w depends on the gas filling of the chamber and on the energy of the alpha
particles. To separate the two effects, E is set equal to $Nw_0 + \varepsilon_0$, where
w_0 is the mean pair formation energy for $E > 4$ Mev, and ε_0 is a parameter
depending on the nature of the gas. ($\varepsilon_0 = 83$ kev for a mixture of argon
and methane). The energy of alpha particles was determined from the

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84974

S/056/60/038/005/052/057/XX
B006/B070

Study of the Alpha Decay of U^{236}

relation $E_{236} = aE_{234} + \varepsilon_o'(1-a)$, where a is the pulse-height ratio of the alpha particles of U^{236} and U^{234}. Thus, $E = (4.488 \pm 0.003)$Mev is obtained. Fig. 1 shows the spectrum of alpha particles for a channel width of 5 kev; the broken curves give the result of an analysis in which account was taken of the distortion of the spectrum due to the conversion electrons. The corresponding level scheme is shown in Fig. 3.
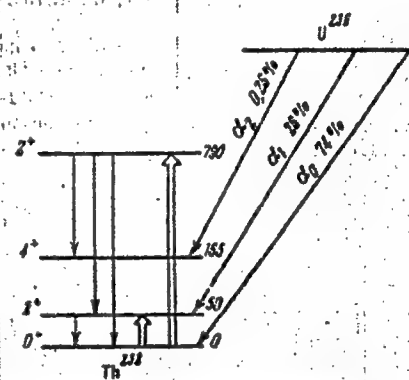
Рис. 1

Рис. 3
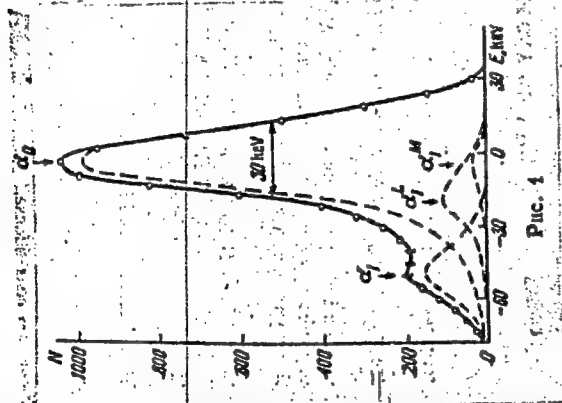
Card 2/3

84914

Study of the Alpha Decay of U^{236} S/056/60/038/005/052/057/XX
B006/B070

Fig. 2 shows the alpha spectrum taken for a channel width of 13.9 kev.
The three alpha groups correspond to the transitions to 0^+, 2^+, and 4^+
level, respectively, of the Th^{232} nucleus. The distance of the α_2 group

from the ground level is 160 kev; the intensity of this group is
$(0.26 \pm 0.1)\%$. Professor S. A. Baranov is thanked for having supplied the
U^{236} samples. There are 3 figures and 8 references: 2 Soviet and 6 US.

ASSOCIATION: Leningradskiy fiziko-tekhnicheskiy institut Akademii nauk
        SSSR (Leningrad Institute of Physics and Technology of the
        Academy of Sciences USSR)

SUBMITTED: December 15, 1959

Card 3/3

KOMAR, A.P.

24.6520

82602

S/056/60/039/01/11/029
B006/B070

AUTHORS: Vorob'yev, A. A., Komar, A. P., Korolev, V. A.

TITLE: Measurement of the Energy of the α-Particles of an Emitter

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960,
             Vol. 39, No. 1 (7), pp. 70-72

TEXT: The authors measured the α particle energies with the help of an
α-spectrometer. The ionization was determined by comparing the pulse
heights of the α particles with those of the generated pulses whose
amplitude could be measured to an accuracy of $\sim 0.01\%$. The chamber used
was filled with 97% Ar and 3% CH_4. The width of the α line was 35 kev.
Table 1 collects a number of relevant data. Th^{228} was chosen as a stand-
ard. In the first column of this table the energy values deduced by a
magnetic analysis are given, the second column gives ionization I, and
the third the energy calculated according to the formula (1)
$(E_{st} - 84)/(E_\alpha - 84) = I_{st}/I_\alpha$, where E_{st} and E_α denote the α energies
of the standard and the emitter under investigation. There is good

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82602

Measurement of the Energy of the α-Particles   S/056/60/039/01/11/029
of an Emitter   B006/B070

agreement between the first and the third columns, from which the con-
clusion is drawn that the method of energy determination from the
ionization in the α spectrometer is suitable. The following results are
obtained:

At^{217}: 7.064 $\pm$ 0.005 Fr^{221}: 6.336 $\pm$ 0.005

Po^{213}: 8.368 $\pm$ 0.010 U_I^{235} : 4.396 $\pm$ 0.003

U_{II}^{235} : 4.211 $\pm$ 0.003 U^{238} : 4.190 $\pm$ 0.005

These values are compared with the results obtained by other authors.
Agreement is good in some cases and not so good in others. Some particular
cases in this connection are discussed. Thus, for example, the values
obtained for the two intensive U^{235} lines (I and II) diverge consider-
ably from those obtained by magnetic spectrometer (Ref. 6). In connection
with this, it is pointed out that the measurements lately made by S.
A. Baranov, A. G. Zelenkov et al. (Ref. 8) of the α spectrum of U^{235}
with a new magnetic spectrometer led to the following values:

Card 2/3

82602

Measurement of the Energy of the α-Particles of   S/056/60/039/01/11/029
an Emitter   B006/B070

E_I = 4.394 ± 0.002 and E_{II} = (4.213 ± 0.002) Mev, and these agree very
well with those obtained in the present work. There are 2 tables and
9 references: 1 Soviet, 1 South African, 2 Canadian, and 5 American.

ASSOCIATION: Leningradskiy fiziko-tekhnicheskiy institut Akademii nauk
             SSSR (Leningrad Physicotechnical Institute of the Academy
             of Sciences, USSR)

SUBMITTED: March 22, 1960

Card 3/3

24.6810

68980

AUTHORS: Komar, A. P., Academician of the AS UkrSSR, S/020/60/131/02/018/071
Krzhemenek, Ya., Yavor, I. P.   B013/B011

TITLE: Photodisintegration of N^{14} Nuclei

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol 131, Nr 2, pp 283 - 285 (USSR)

ABSTRACT: Certain facts concerning the photodisintegration of N^{14} nuclei had
hitherto been unexplained. The present paper clarifies certain de-
tails of photodisintegration, especially the mechanism of the (γnp)
reaction, which has a large yield. This photodisintegration was in-
vestigated here by means of a cloud chamber in a constant magnetic
field (H = 6700 oersteds). These experiments were made with maximum
γ- bremsstrahlung energy of 90 Mev. The photodisintegration were
identified by comparing certain factors (as e.g. range, density of
ionization, direction of the tracks, etc.). Moreover, the proton
energy (determined from the curvature of the proton track in the
magnetic field) was compared with the energy determined from the
range of the recoil nucleus. In the (γnp) reaction these energies
can differ greatly from one another. It is possible by this method
to make a reliable distinction between the reactions (γp) and (γnp).
Furthermore, it was possible to determine accurately the departure
angles of the neutrons of the reaction (γnp). Table 1 contains the

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Photodisintegration of N^{14} Nuclei

relative yields of the photonuclear reactions on nitrogen. These
data were determined from 2633 photodisintegrations. The total ab-
sorption cross section of γ-quanta amounted to 9.8+0.8 mb/Q. The
total integral absorption cross section of γ-quanta on N^{14}
(0.3 Mev.barn) determined by the authors in the experimental way is
in good agreement with the corresponding theoretical value
(0.29 Mev.barn). The proton yield at relatively high energies is
very considerable. The dependence of the cross section of the re-
action (γp) on the energy of the γ-quanta was determined from the
energy spectrum of the photoprotons of the reaction (γp). The maxi-
mum of the cross section is found at the energy $\sim$ 23 Mev of the
γ-quanta. The integral cross section of the reaction (γp) amounts to
0.07 Mev.barn. Figure 2 shows the angular distribution of the pro-
tons of the reaction (γp). For E_p from 0.4 to 50 Mev it can be
described by the expression $1 + 1.3 \sin^2 \theta + 0.16 \cos \theta$, and for
$E_p > 10$ Mev $1 + 2\sin^2 \theta + 0.25\cos \theta$ holds. The major part of the re-
actions (γp) on nitrogen is caused by a direct resonance process.
All 12-Mev protons stem from the $p_{3/2} \rightarrow d_{5/2}$ transitions. Figure 1

Card 2/3   shows the energy spectrum of the protons emitted in the reaction

Photodisintegration of N^{14} Nuclei

(γnp). The maximum of the proton-energy spectrum is found at proton energies of $\sim$ 1.5 Mev. The neutrons are probably emitted with greater energies as compared with the protons. These and other re- sults can be explained by the assumption that in most cases ($\sim 2/3$) the reaction (γnp) proceeds as follows: A neutron is first emitted with relatively great energies, and thereupon a proton from the excited nucleus N^{13}. On the strength of data found here it is possible to estimate the contribution of the protons that depend on the "quasi-deuteron" mechanism of the interaction of γ-quanta with the nitrogen nuclei, and also the yield of protons with energies of more than 18 Mev can thus be estimated. This contribution is of the order of $\sim$ 1%. Further data concerning other photodis- integrations of nitrogen are being worked out. There are 2 figures, 1 table, and 12 references, 3 of which are Soviet.

ASSOCIATION: Fiziko-tekhnicheskiy institut Akademii nauk SSSR (Institute of Physics and Technology of the Academy of Sciences of the USSR)

SUBMITTED: December 16, 1959

Card 3/3

AUTHORS: Komar, A. P.,   Academician of the AS UkrSSR, Makhnovskiy,
                Ye, D., Poddubnov, V. P.

TITLE: The Relative Yield and the Energy Distribution of Photo-
                deuterons From Copper

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 133, No. 4,
                pp. 797-799

TEXT: The authors measured the ratio between the photodeuteron yield and
the photoproton yield from copper and the energy distribution of these
particles at the maximum energy of the bremsspectrum of the 70 Mev gamma
radiation. Basing on Fig. 1, the authors discuss details of the experimen-
tal setup. A special pulse method was developed for the identification of
the particles, and formulas (1) and (2) are given for the calculation of
the radius of curvature of the particle path in the magnetic field
(11,500 oe) toward the emulsion. The authors worked with an НИКФИ-Я 2
(NIKFI-Ya2) 400 μ thick nuclear emulsion. Fig. 2 shows the radii of
curvature as a function of the particle ranges in the emulsion and the

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The Relative Yield and the Energy Distribution   S/020/60/133/04/12/031
of Photodeuterons From Copper   B019/B060

"error zone". The energy distribution of the identified protons that was
obtained, is in good agreement with the results obtained by other authors.
Fig. 3 shows the energy distribution of photodeuterons. In agreement with
Byerly and Stephens (Ref. 1) the conclusion is drawn that the maximum of
the energy distribution is below 4 Mev. The ratio of the deuteron yield
with energies of 4 - 10 Mev and the proton yield of the same energy is found
to be $0.07_8 \pm 0.04_1$. In the energy range of 3 - 10 Mev it is found to be
$0.08_6 \pm 0.04_5$. There are 3 figures and 3 non-Soviet references.

ASSOCIATION: Fiziko-tekhnicheskiy institut Akademii nauk SSSR
               (Physicotechnical Institute of the Academy of Sciences, USSR)

SUBMITTED: May 3, 1960

Card 2/2

S/020/60/135/001/013/030
B006/B056

AUTHORS: <u>Komar, A. P.,</u> Academician of the AS UkrSSR and
<u>Makhnovskiy, Ye. D.</u>

TITLE: The Fine Structure of the Energy Spectrum of <u>Photoprotons</u> *19*
and the Levels of the <u>Li^6</u>-Nucleus

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 135, No. 1,
pp. 52-54

TEXT: Following an earlier paper (Ref. 1), the authors report on measure-
ments of the energy distribution of protons from Li^6 irradiated with
gamma rays of the bremsstrahlung spectrum with $E_{\gamma max}$ = 28 Mev. The target,
enriched in Li^6 to 90% was 8.6 mg/cm^2 thick. The protons were recorded
by means of НИКФИ-Я2 (<u>NIKFI-Ya2</u>) nuclear emulsions (400 μ); the
plates were orientated at an angle of 60° to the proton beam axis. Measure-
ments were made on all tracks with a length of $\geqslant 4$ μ, which began on the
emulsion surface and satisfied the geometrical criteria. The plates were
evaluated in 1350-fold enlargement. The background, due to Li$^6(\gamma,d)$He^4

Card 1/3

The Fine Structure of the Energy Spectrum of   S/020/60/135/001/013/030
Photoprotons and the Levels of the   B006/B056
Li^6-Nucleus

reactions, was about 1% less than 10% of the measured tracks due to
photodisintegrations of the Li^7 admixture. The background due to the ap-
paratus (scattered radiation) was $< 3\%$. The proton spectrum measured is
shown in Fig. 1. The proton energy (Mev) was measured in the laboratory
system. According to Refs. 2-4, the reactions (γ,n) and (γ,p) on Li^6 de-
veloped under formation of the non-stable nuclei Li^5 and He^6 especially
in the ground state. The question is now discussed what E_p-peaks in the

decay of these nuclei may occur in $\alpha+p$, also in the case of the formation

of Li^5 and He^5 in excited states. The following E_p-peaks were measured:

4.1, 4.5, 5.5, and 11.6 Mev; determined levels: 11.2 and 18.3 Mev; pro-
posed levels: 9.5 and 10.0 Mev. (According to Ref. 5 there exists a level
with 9.3 ± 0.2 Mev and according to a paper by Ye. A. Al'bitskaya et al. one
at 10 Mev). There are 1 figure, 1 table, and 5 references: 2 Soviet, 2 US,
and 1 British.

ASSOCIATION: Fiziko-tekhnicheskiy institut Akademii nauk SSSR (Institute
                of Physics and Technology of the Academy of Sciences USSR)

SUBMITTED: July 13, 1960

Card 2/3

S/020/60/135/002/011/036
B019/B077

AUTHORS: Komar, A. P., Academician of the AS UkrSSR, Krzhemenek, Ya.,
             and Yavor, I. P.

TITLE: Photodisintegration of Ne^{22}

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 135, No. 2,
             pp. 291 - 293

TEXT: The investigations of Ne^{22} photodisintegration were done in a cloud
chamber which was placed in a magnetic field of 6700 oerrºeds. The isotopic
mixture was composed of 89% Ne^{22}, 10% Ne^{20}, and 1% Ne^{21}. The maximum energy
of the γ-beam was 90 Mev. Table 1 gives several relative outputs of the
recorded photodisintegrations. The energy distribution of the photoprotons
of the (γ, p) and (γ, pn) reactions are given along with their angular
distribution. A short discussion of the results follows. There are
4 figures, 1 table, and 4 references: 3 Soviet and 1 US.

SUBMITTED: July 15, 1960

Card 1/2

Kinetic energy of Th^{232}...

21412
S/089/61/011/006/009/01.4
B102/B138

The contour diagram for the fragment energy distribution shows that asymmetric, as well as symmetric fragmentations occur, and that the mass ratio m_2/m_1 diminishes as the mass of the disintegrating nucleus increases. For Th^{232}, U^{238} and Cf^{252}, m_2/m_1 is 1.56, 1.36, and 1.31, respectively. The figure 1.56 was determined from the fragment mass distribution. From the total energy distribution it can be seen that the most probable total energy $E = E_1 + E_2$ is lower and the half-width of the peak (45 Mev) higher, than the respective values for U^{238} photofission. The following numerical values for most probable fragment energy (Mev) were determined:

Heavy fragments: 52 + 2 + 6.8 = 61 ± 2
Light fragments: 89 + 2 + 5.6 = 97 ± 2
heavy + light f.:   143 + 2 + 12 = 157 ± 3

The authors thank the proton-synchrotron team of the FTI AN SSSR, and G. N. Nikolayev and K. Shvets for assistance. There are 4 figures, 1 table, and 4 references: 2 Soviet and 2 non-Soviet. The two references to English-language publications read as follows: D. Hiller, D. Martin. Phys. Rev., 90, 581 (1953); R. Jensen, A. Fairhall. Phys. Rev., 109, 942 (1958).
Card 2/2

VOLKOV, Yu.M.; KOMAR, A.P.; KOROLEV, G.A.; KOCHAROV, G.Ye.

Application of an ionization α-spectrometer with a time ana-
lyzer for half-life determinations. Izv. AN SSSR. Ser. fiz.
25 no.9:1188-1196 '61.   (MIRA 14:8)

1. Fiziko-tekhnicheskiy institut im. A.F. Ioffe AN SSSR.
                (Spectrometry)
                (Radioactive substances—Decay)

S/057/61/031/001/016/017
B104/B204

21, 2000

AUTHORS: Komar, A. P.,   Mikheyev, G. P.,   and Chernov, N. N.

TITLE: A System for the extremum control of the intensity of
               gamma radiation of a synchrotron

PERIODICAL: Zhurnal tekhnicheskoy fiziki, v. 31, no. 1, 1961, 109-115

TEXT: The authors describe an extremum control system which had been
constructed for the synchrotron of the institute mentioned under Association
and which controls simultaneously two parameters which, essentially,
determine the stability of the intensity of gamma radiation. In the first
part of this paper, an extremum controller with one input parameter is
studied. The so-called step modulation of the input parameter is mentioned
as the most favorable control method. The injection time T is considered
to be the input parameter. This injection time changes with a constant
frequency and the amplitude δT. Thus, the initial quantity, i.e., the
intensity of gamma radiation assumes the values I' according to the
injection time T, and I" according to the injection time T + δT. The
sign of the difference (I" - I') is determined from these values.

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A system for the extremum control...   S/057/61/031/001/016/017
                                                         B104/B204

If $(I'' - I') < 0$, the operating point is to the left of the extremum, and
if it is > 0, it is to the right of it. Thus, $T = k \operatorname{sign}(\overline{I}'' - \overline{I}')$ (1),
where T is the increment of the injection time, $\overline{I}''$ and $\overline{I}'$ are the mean
values of the intensities corresponding to the injection times T and
$T + \delta T$. For improving the quick response, the authors, in the scheme
developed by them, used not only the sign of $(I'' - I')$ according to (1),
but also the amount of this difference according to the relation
$T = \frac{1}{k}(\overline{I}'' - \overline{I}')$ (2), where k is the negative feedback factor. In order
that the quantity $\delta(\Delta T)$ be as small as possible, a high amplification
factor is necessary for the feedback. A scheme based on this principle
is shown in Fig. 1 as a block diagram, whereas in Fig. 2 it is shown as
a circuit diagram. A parameter which just as important for a synchrotron,
is the instant T_{hf} where the high-frequency voltage is connected to the
resonator of the synchrotron. It is shown that for normal operation of
a system of several extremum controllers the demand that the extremum
controllers do not act upon one another need not necessarily be fulfilled.

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A system for the extremum control ...

S/057/61/031/001/016/017
B104/B204

This demand may be satisfied if the extremum controllers operate alternatively. In this way, however, a reduction of the quick response is caused, and the question is examined how far an incomplete decoupling of the two extremum controllers is permissible. For this purpose, it is sufficient to modulate the two input parameters by means of another frequency. Fig. 3 shows a system of two extremum controllers which operate according to this principle. Blocks (1) and (2) correspond to blocks (1) and (2) in Fig. 1, the dashed blocks correspond to the dashed block in Fig. 1. By means of this extremum controller, T and T_{hf} are controlled, and the good results obtained from this controller are discussed. Scientific collaborator A. V. Kulikov is thanked for interest and advice. There are 4 figures and 5 Soviet-bloc references.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN SSSR Leningrad
(Institute of Physics and Technology AS USSR, Leningrad)

SUBMITTED: June 15, 1960

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